The State of Utah contracted separately with IHI Environmental to examine the Capitol for environmentally hazardous materials and to make recommendations for the removal or mitigation of the dangers of the same. IHI prepared a 500-page report, a 28-page excerpted summary of which is included in the main body of the report. An even more abbreviated summary of key recommendations is provided below. Inasmuch as we are recommending the demolition of some of the buildings examined in the IHI report, and whereas the primary focus of our report is the Capitol building itself, we limit our summary to recommendations regarding the Capitol. Readers interested in greater detail for either the Capitol or the other buildings on the Capitol campus are referred to the expanded summary herein, or to larger report in the possession of the state. It should also be noted that some of the remedial action recommended the IHI report has been completed and may be ongoing. The preparers of this report have not informed as to the extent of remediation or mitigation at the time of this writing.

* Locate all asbestos in the building
* Where possible, manage asbestos in place without endangerment
* Remove/abate asbestos impacted by demolition or renovation
* Follow standard asbestos maintenance and removal practices and regulations
* Abate lead paint during demolition or renovation which disturbs painted surfaces
* Follow standard lead paint maintenance and removal practices and regulations
* Designate clean hand washing, eating and change areas
* Do follow-up testing of lead content in Capitol water
* Based on tests, replace any lead-contaminated drinking fountains and piping
* Remediate or abate any other conditions involving hazardous materials or waste

March 20, 2000 Report:

Asbestos Survey and Assessment
Lead-base Paint Inspection
Drinking Water Sampling
Universal Hazardous Waste Report
Asbestos Management

I. PURPOSE

Information in this document applies to State of Utah Division of Facilities Construction and Management (DFCM) and Capitol Building employees and any other personnel involved in construction, maintenance, or remodeling in this facility. A copy of this plan should be readily available to State employees in their work area.

The State of Utah DFCM asbestos program goals are to -

Inspect buildings for asbestos.

Manage asbestos "in place" when possible to do so without endangering health or the environment.

Remove (abate) asbestos during renovations or demolitions.

- Remove (abate) damaged asbestos when discovered.

Train appropriate employees concerning asbestos operations and maintenance practices and asbestos regulations.

Custodial personnel and others doing maintenance and repair work in the facility should acquaint themselves with the contents of this notification. They should pay particular attention to the survey summary (Section III and Tables 1 and 2), the lab results of suspect asbestos materials (Section IV and tables 3 and 4), and State policies and be familiar with procedures for handling asbestos-containing materials (ACM) (Section V).

A partial removal of ACM identified in this plan has been completed. Particular attention should be given to Section III of this plan, which lists the ACM known to still be in the building.

In the future, care should be taken to ensure that no asbestos-containing construction or patching materials are used in this building.

II. BACKGROUND

Asbestos is a naturally occurring mineral. It is distinguished from other minerals by the fact that its crystals form into long thin fibers. Asbestos proved well-suited for many uses in the construction trades because of its unique properties - it does not burn, it is strong, it is good insulator of heat and electricity, and it is not broken-down by chemicals. Asbestos fibers become a significant health concern when they are inhaled. Exposure to

asbestos fibers has been linked to *asbestosis* (scarring [fibrosis] of the lung), *lung cancer* (malignant tumor of the bronchi covering), *mesothelioma* (cancer of the chest cavity lining), and other diseases of the lung and chest cavity.

The State of Utah DFCM intends that no occupant or worker inside of a State facility should be exposed to airborne asbestos fibers at concentrations potentially hazardous to health, and has initiated a program to manage potential asbestos problems in its facilities. Procedures outlined in this notification should be followed. Only qualified personnel who have been properly trained and equipped are authorized to handle or remove ACM.

This plan is based primarily on the asbestos resurvey completed at the facility on March 3, 2000 by IHI Environmental. The suspect materials sampled and number of samples collected in this survey were consistent with commonly used sampling protocols in use at the time it was conducted. However, information in this management plan is considered adequate for most asbestos-related decisions relative to suspect asbestos-containing materials sampled. A summary of the survey findings, including building locations where ACM was discovered, is included. A copy of the entire survey report may be obtained by contacting the State of Utah DFCM Facilities Coordinator at (801) 538 1480.

III. SPECIFIC LOCATIONS OF ASBESTOS-CONTAINING MATERIAL (ACM)

The following summary lists the specific locations where ACM were identified in this building. Asbestos-containing materials are defined as containing greater than 1% asbestos by weight. The summary also lists the type and quantity of construction materials containing the asbestos and the percentage and specific types of asbestos in the materials. [Chrysotile (C), Amosite (A), Crocidolite (Cr), Anthophyllite (An), Tremolite (T), or Actinolite (Ac)].

EXECUTIVE SUMMARY

Asbestos-containing materials (ACM) were identified in the Capitol Building at the State Capitol Complex as follows:

Material	Location	Quantity	% Asbestos	Friable*	Condition*
9" floor tile and mastic	Second floor: East section; Third floor: Rms. 318, 322,324, 326,328, 330; Fourth floor: East section and Legislative Auditors General offices	36,065 sq. ft.	>1% C (tile) 5-8% C (mastic)	No	Good
12" floor tile and mastic	Basement: hallway by B-49, E. rm. by B-61 & women's locker rm	1,370 sq. ft.	>1% C	No	Good
Red sheet vinyl	Second floor: Attorney General's restroom	40 sq. ft.	25% C	Yes	Good
Yellow sheet vinyl	Third floor: kitchen; Basement: mechanical room's office, and men's locker room	550 sq. ft.	70% C	Yes	Good
Pipe fitting insulation	Basement: throughout	210 units	1.2% C	Yes	Fair
Pipe insulation (Aircell®)	Basement: east section, N. entrance, N.W. section; Attic: throughout	2,700 lin. ft.	80% C	Yes	Good
Pipe insulation (magblock)	Basement: east section, N. entrance and N.W. section	275 lin. ft.	12% A 1% Cr	Yes	Good

C= chrysotile A= amosite Cr= crocidolite

*** Friability and condition of material at time of survey. May not be representative of current friability and condition.**

IV. BULK SAMPLING RESULTS

Representative samples of accessible building materials suspected of containing asbestos were collected and forwarded to an accredited laboratory for analysis. Samples were analyzed using the National Institute for Occupational Safety and Health (NIOSH) approved polarizing light microscopy methods. All materials with greater than 1.0% asbestos by weight are identified as ACM.

Sample locations and ACM locations are shown on attached building floor plans. See Tables 3 and 4 for results of the laboratory analysis of the bulk samples collected at the State Capitol Building facility.

V. POLICY AND PROCEDURES

Employees who may be working near asbestos should receive at least two hours of asbestos awareness training and follow the work practices in the O&M Program.

The specific locations in this building where ACM have been identified are listed in Section III of this notification. While every attempt was made to conduct a thorough survey of the building, it is possible that some suspect asbestos materials may have been overlooked because they were inaccessible, (under furnaces, or inside walls, attics, or crawl spaces with no apparent access points) or not commonly considered by the consultant at the time of the survey to be suspect asbestos-containing construction materials.

Typical suspect materials include pipe, boiler, and tank insulation; sprayed or troweled-on ceiling and wall coatings; ceiling tiles and adhesives; asbestos-cement (Transite) panels and pipes; floor tiles and flooring adhesives; vinyl floor sheeting (linoleum); roofing tars, felts, shingles and patching compounds; duct insulation; duct fire dampers and vibration isolators; fire door cores; electrical wiring coverings; and dry wall joint compound.

Before you remove, cut, sand, drill, break or otherwise disturb, damage, or work on or with ACMs or suspect ACMs in your building, which have not been sampled. If you have questions, contact your management. These same policies and precautions refer to all personnel who may be involved in any type of construction, maintenance, or remodeling in this facility.

Should a true emergency occur (such as the falling of textured ACM ceiling material or a ruptured steam or hot water line with ACM thermal insulation), immediately seal off the area and turn off all heating and ventilation to/from the area to prevent the spread of fibers to other parts of

the building. Because of the stringent precautions required in handling, removing, and disposing of ACM, in no case should building custodians or other unqualified personnel attempt to perform these operations.

VI. ACM LOCATION PLANS

(See attached building floor plans.)

VII. PHOTO LOG

(See attached photos for ACMs.)

Table 1

Asbestos-containing Materials by Homogeneous Area

Capitol Building-Capitol Hill Complex

Homogeneous Area Number	Material Description/Location	Friability	Asbestos Content	Amount
M001	**Floor Tile** 9-inch off-white floor tile with brown speckles Second floor: East section; Third floor: Rooms 318, 322, 324, 326, 328, 330; Fourth floor: East section and Legislative Auditors General offices	Category 1 Non-friable	>1% Chrysotile	36,065 sq. ft
	The floor tile is under glued-down carpet or tacked-strip carpet and over concrete.			
M001A	**Floor Mastic** Black tar floor mastic Under M001	Category 1 Non-friable	5-8% Chrysotile	36,065 sq. ft.
M002	**Floor Tile** 12-inch off-white floor tile Hallway by B-49, east room by B-61 and Women's Locker Room on the Basement Floor	Category 1 Non-friable	>1% Chrysotile	1,370 sq. ft.
	The floor tile is exposed and over concrete.			
M002A	**Floor Mastic** Black tar floor mastic Under M002	Category 1 Non-friable	>1% Chrysotile	1,370 sq. ft.
M003	**Suspended Ceiling Tiles** 2' x 4' Ceiling tile with 5-star pinhole pattern Throughout first, second, third and fourth floors	Friable	1.2% Amosite	0
	The current survey confirmed that this homogeneous material has been removed from the Capitol Building. Survey information for this material was input from a prior survey.			

Homogeneous Area Number	Material Description/Location	Friability	Asbestos Content	Amount
M010	**Electrical Wiring** Brown resin insulation Wiring on round light fixtures in restrooms	Friable	90% Chrysotile	0
	These light fixtures has been removed from the building.			
M011	**Vinyl Sheet Flooring** Red vinyl sheet flooring with white binder Second floor: Attorney General's Restroom	Category 1 Non-friable	25% Chrysotile	40 sq. ft.
	The Attorney General's office and restroom were not accesible at the time of the survey. The vinyl sheet flooring listed above was sampled during a previous survey.			
M014	**Floor Tile & Mastic** 9-inch brown floor tile and black tar mastic Northwest offices by the Governor's Office on the second floor	Category 1 Non-friable	>1-2% Chrysotile	0 sq. ft.
	The floor tile and mastic have been removed			
M017	**Vinyl Sheet Flooring** Red vinyl sheet flooring with white binder Lt. Governor's section on the second floor	Category 1 Non-friable	2% Chrysotile	0
	This sheet vinyl flooring had been removed from the Capitol Building.			
M019	**Vinyl Sheet Flooring** Yellow vinyl sheet flooring with white binder Second floor: kitchen; Basement: mechanical room's office and men's locker room	Category 1 Non-friable	70% Chrysotile	550 sq. ft.
M022	**Leveling Compound** Red cemetitious compound Second Floor: Lt. Gonernor's Offices,	Category 2 Non-friable	2% Chrysotile	2,100 sq. ft.
	This material is assumed to be in other areas of the Capitol as well.			
T002	**Pipe Fitting Insulation** Gray plaster on pipe fittings Basement: throughout	Friable	1.2% Chrysotile	210 units
	The asbestos-containing insulation is on the pipe fittings for steam, condensate, heating and chiller supply and return lines. These fittings are mainly in the basement and mechanical room.			

Homogeneous Area Number	Material Description/Location	Friability	Asbestos Content	Amount
T004	**Heat Exchanger Insulation** Gray plaster insulation covered with red canvas Basement mechanical room *This heat exchanger insulation has been removed.*	Friable	40% Amosite 10% Chrysotile	0 sq. ft.
T007	**Pipe Insulation** Aircell insulation Basement: east section, north entrance and N.W. section; Attic: throughout	Friable	80% Chrysotile	2,700 ln. ft.
T009	**Pipe Insulation** White magblock insulation Basement: east section, n. entrance and N.W. section	Friable	12% Amosite 1% Crocidolite	275 ln. ft.

Table 6
Estimated Abatement Costs by Homogeneous Area
Capitol Building-Capitol Hill Complex

Homogeneous Area Number	Material	Amount		Unit Cost	Extended Cost
M001	Floor Tile	36,065	sq. ft.	$1.15	$41,475
M001A	Floor Mastic	36,065	sq. ft.	$1.21	$43,639
M002	Floor Tile	,370	sq. ft.	$1.15	$1,576
M002A	Floor Mastic	1,370	sq. ft.	$1.21	$1,658
M003	Suspended Ceiling Tiles	0		$0.00	$0
M010	Electrical Wiring	0		$0.00	$0
M01	Vinyl Sheet Flooring	40	sq. ft.	$3.28	$131
M014	Floor Tile & Mastic	0	sq. ft.	$2.36	$0
M017	Vinyl Sheet Flooring	0		$0.00	$0
M019	Vinyl Sheet Flooring	550	sq. ft.	$3.28	$1,804
M022	Leveling Compound	2,100	sq. ft.	$10.52	$22,092
T002	Pipe Fitting Insulation	210	units	$11.17	$2,346
T004	Heat Exchanger Insulation	0	sq. ft.	$0.00	$0
T007	Pipe Insulation	2,700	ln. ft.	$11.17	$30,159
T009	Pipe Insulation	275	ln. ft.	$11.17	$3,072
		Total Estimated Abatement Cost			**$147,950**

Note: Estimated abatement costs do not include replacement costs or costs for a consultant to manage the abatement.

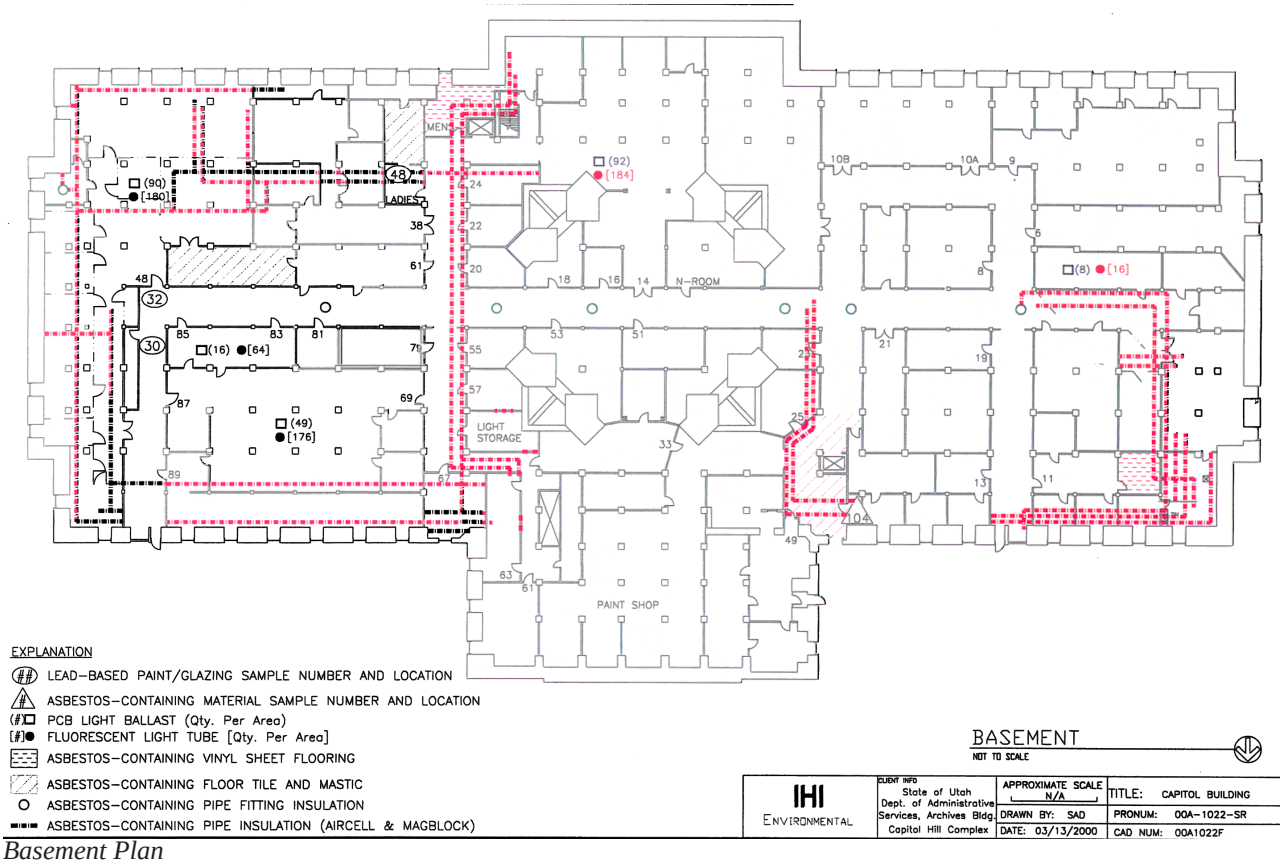
Executive Summary

Asbestos-containing Materials by Homogeneous Area

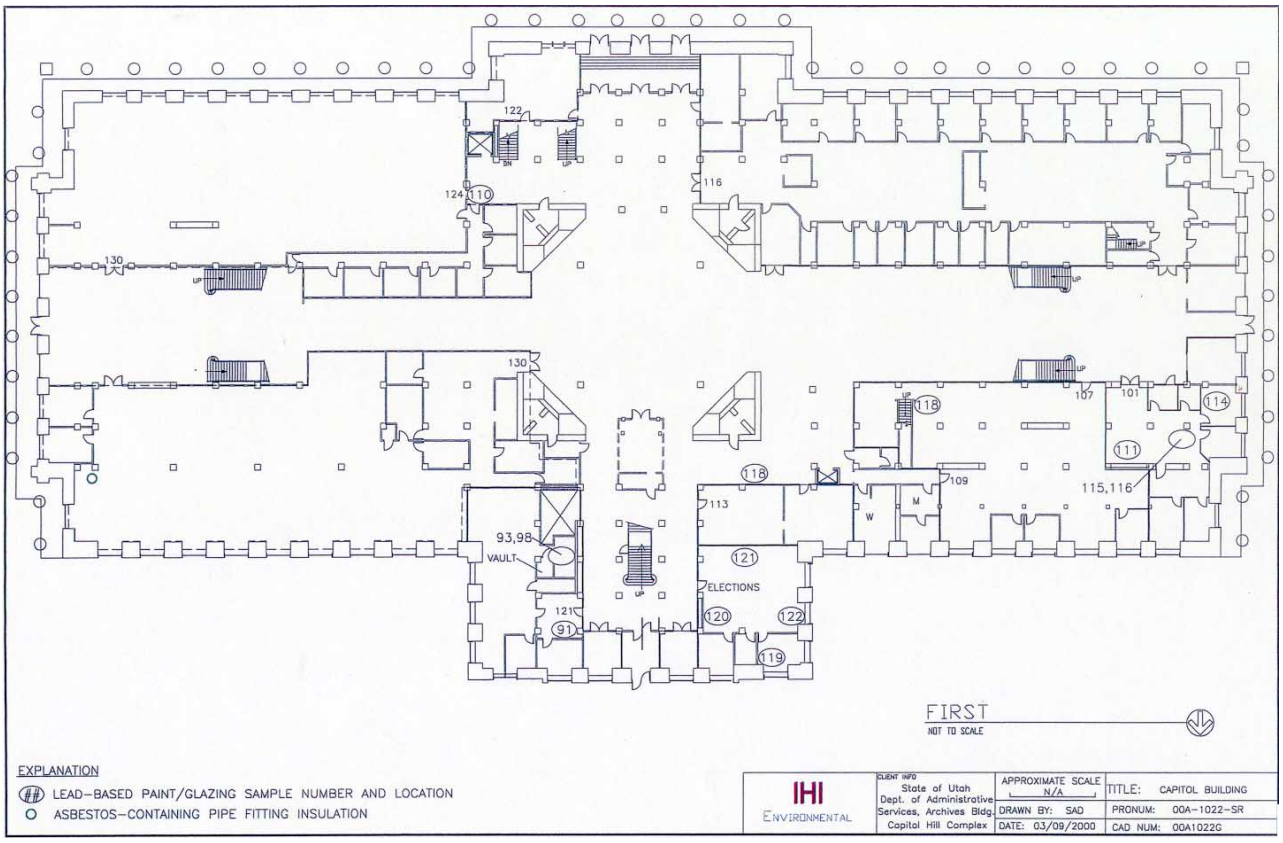
Capitol Building-Capitol Hill Complex

Homogeneous Area Number	Material Description/Location	Asbestos Content	Amount	Damage Assessment
M001	**Floor Tile - 9-inch off-white floor tile with brown speckles** Second floor: East section; Third floor: Rooms 318, 322, 324, 326, 328, 330; Fourth floor: East section and Legislative Auditors General offices	>1% Chrysotile	36,065 sq. ft.	No Damage
M001A	**Floor Mastic - Black tar floor mastic** Under M001	5-8% Chrysotile	36,065 sq. ft.	No Damage
M002	**Floor Tile - 12-inch off-white floor tile** Hallway by B-49, east room by B-61 and Women's Locker Room on the Basement Floor	>1% Chrysotile	,370 sq. ft.	No Damage
M002A	**Floor Mastic - Black tar floor mastic** Under M002	>1% Chrysotile	1,370 sq. ft.	No Damage
M003	**Suspended Ceiling Tiles - 2' x 4' Ceiling tile with 5-star pinhole pattern** Throughout first, second, third and fourth floors	.2% Amosite	0	Not applicable
M010	**Electrical Wiring - Brown resin insulation** Wiring on round light fixtures in restrooms	90% Chrysotile	0	No Damage
M011	**Vinyl Sheet Flooring - Red vinyl sheet flooring with white binder** Second floor: Attorney General's Restroom	25% Chrysotile	40 sq. ft.	No Damage
M014	**Floor Tile & Mastic - 9-inch brown floor tile and black tar mastic** Northwest offices by the Governor's Office on the second floor	>1-2% Chrysotile	0 sq. ft.	No Damage

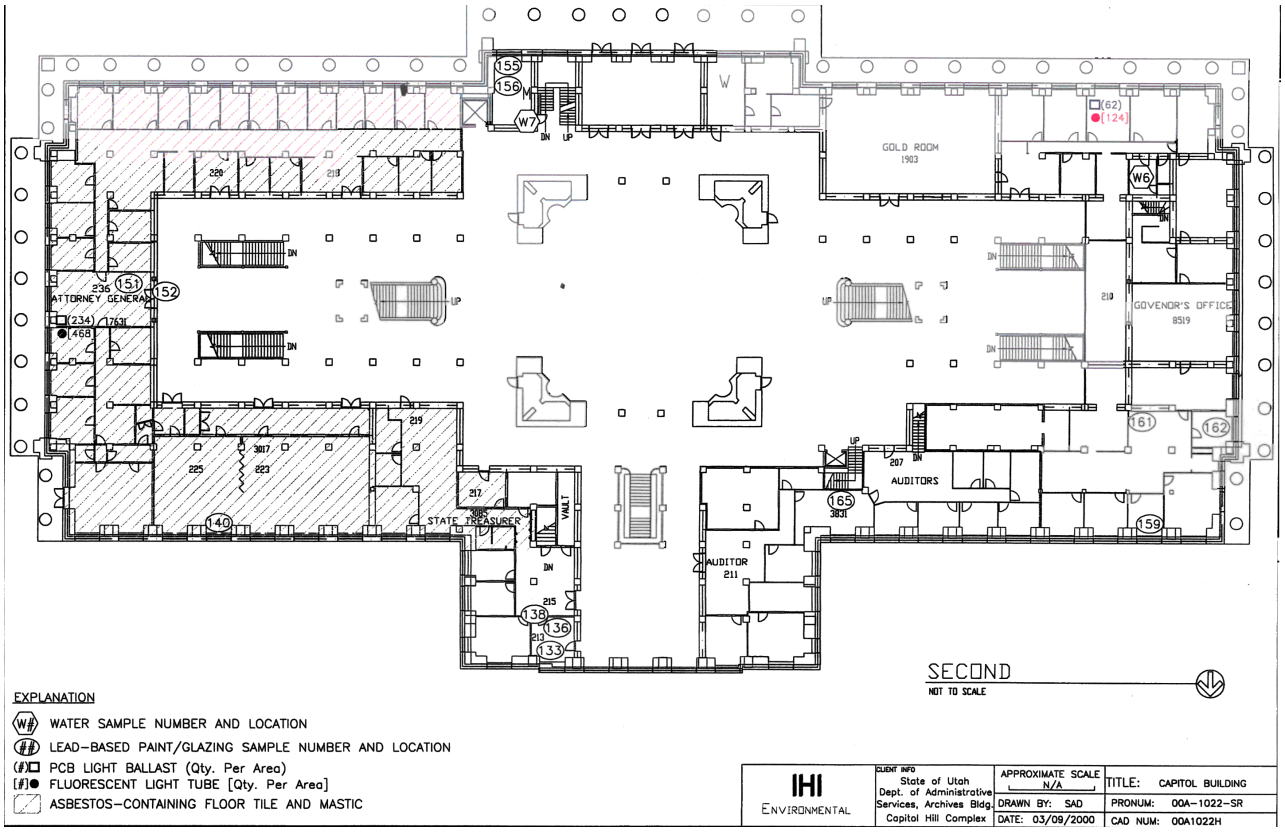
Homogeneous Area Number	Material Description/Location	Asbestos Content	Amount	Damage Assessment
M017	**Vinyl Sheet Flooring - Red vinyl sheet flooring with white binder** Lt. Governor's section on the second floor	2% Chrysotile	0	
M019	**Vinyl Sheet Flooring - Yellow vinyl sheet flooring with white binder** Second floor: kitchen; Basement: mechanical room's office and men's locker room	70% Chrysotile	550 sq. ft.	No Damage
M022	**Leveling Compound - Red cemetitious compound** Second Floor: Lt. Gonernor's Offices,	2% Chrysotile	2,100 sq. ft.	No Damage
T002	**Pipe Fitting Insulation - Gray plaster on pipe fittings** Basement: throughout	1.2% Chrysotile	210 units	Slight Damage
T004	**Heat Exchanger Insulation - Gray plaster insulation covered with red canvas** Basement mechanical room	40% Amosite 10% Chrysotile	0 sq. ft.	No Damage
T007	**Pipe Insulation - Aircell insulation** Basement: east section, north entrance and N.W. section; Attic: throughout	80% Chrysotile	2,700 ln. ft.	No Damage
T009	**Pipe Insulation - White magblock insulation** Basement: east section, n. entrance and N.W. section	12% Amosite 1% Crocidolite	275 ln. ft.	No Damage



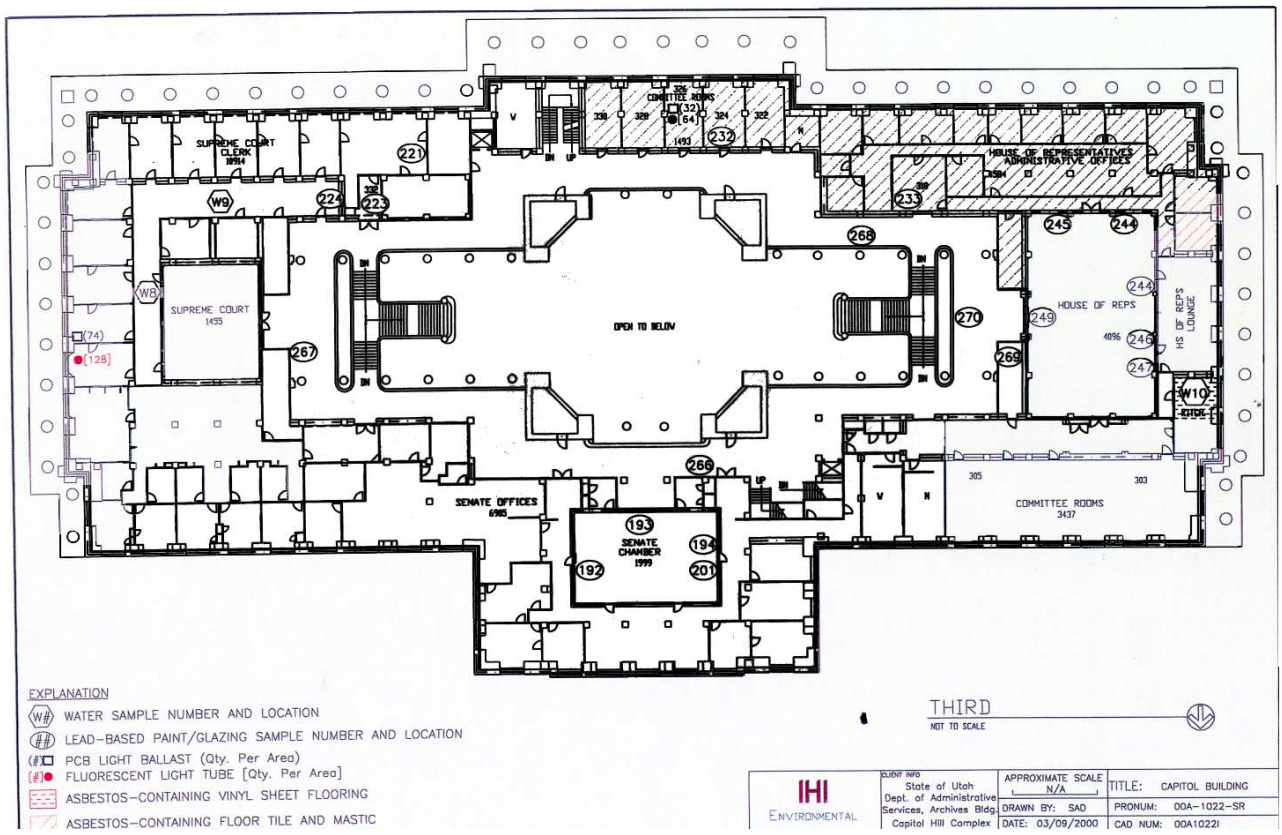
Basement Plan



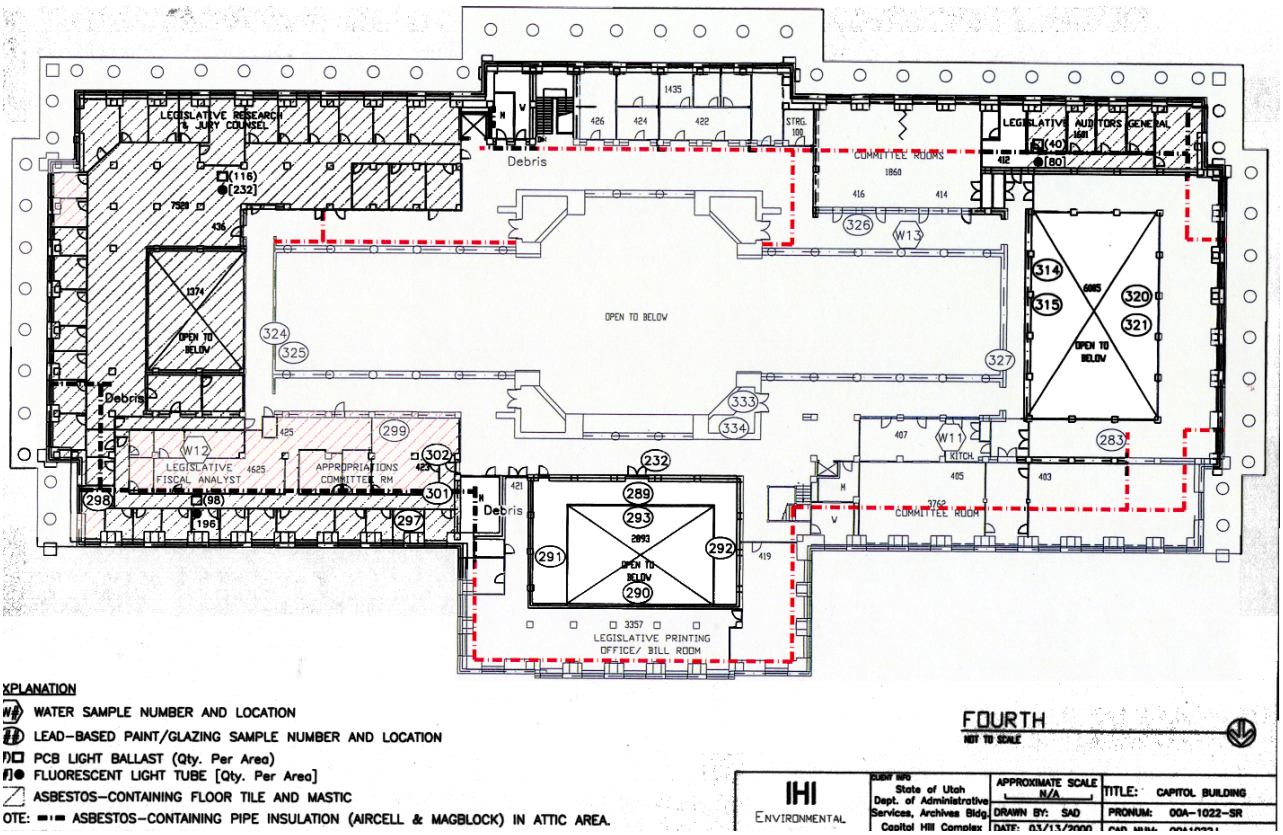
First Floor Plan



Second Floor Plan



Third Floor Plan



Fourth Floor Plan

Photograph 1

View of the asbestos-containing 9-inch floor tile (M001). The black floor mastic (M001A) underneath also contains 15% Chrysotile asbestos.

Photograph 2

View of the 12-inch non asbestos floor tile (M002). The black floor mastic contains >1% Chrysotile asbestos.

Photograph 3

View of the asbestos-containing 9" floor tile and mastic (M014).

Photograph 4

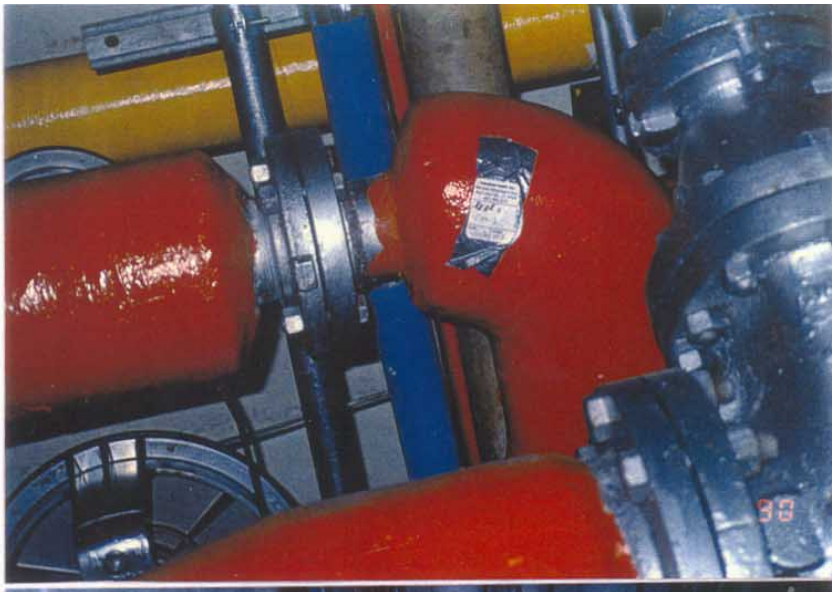
View of the asbestos-containing red vinyl sheet flooring (M011). This area was not accessible at the time of the survey.

Photograph 5

View of the asbestos-containing yellow sheet vinyl flooring (M019)

Photograph 6

This asbestos white vinyl sheet flooring in the men's locker room in the basement.



Photograph 7

View of the asbestos-containing pipe fitting insulation (T002)

Photograph 8

View of the asbestos-containing aircell pipe insulation (T007)

Photograph 9

View of the asbestos-containing magblock pipe insulation (T009).

LEAD-BASED PAINT INSPECTION

UTAH STATE CAPITOL HILL COMPLEX
STATE OF UTAH
SALT LAKE CITY, UTAH

Introduction

During the period of February 5, 6, 12, and 13, 2000, a lead-based paint (LBP) survey was conducted at the Utah State Capitol, Archives, Boiler Plant, Greenhouse, Round House and stairwells of the State Office Building. The purpose of the survey was to identify lead in paint on interior and exterior surfaces of the building. Measurements for lead in paint were made using a Radiation Monitoring Devices, Inc. (RMD) LPA-1 X-ray Fluorescence (XRF) Spectrum Analyzer. Chip sampling and laboratory analysis was performed for confirmation of low XRF measurements.

The survey was conducted by Oulono Folau and James Nicol with IHI Environmental (IHI) in Salt Lake City, Utah. Mr. Folau and Mr. Nicol have completed Lead Inspector and Risk Assessor Training through the Rocky Mountain Center for Occupational and Environmental Health, an EPA-sponsored Regional Lead Training Center, and are certified by the State of Utah, Division of Environmental Quality, as Lead Inspector and Risk Assessor.

The U.S. Department of Housing and Urban Development (HUD) *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* (HUD Guidelines), Chapter 7: Lead-Based Paint Inspection, 1997 Revision, were generally followed for this survey, with modifications appropriate for a non-residential building.

Building Description

See Section 2.0 Building Description of the Asbestos Survey and Assessment Update Report for each of the building.

Lead-Based Paint Definitions

HUD defines "lead-based paint" as any coating that has a lead concentration of 1.0 milligram of lead per square centimeter (1.0 mg/cm^2) or greater, or if the lead concentration is greater than 0.5% by weight. The Consumer Product Safety Commission (CPSC) currently considers paint to be lead-containing if the concentration of lead exceeds 600 ppm (0.06% by weight). In 1978, the CPSC banned the sale of lead-based paint to consumers, and banned its application in areas where consumers have direct access to painted surfaces. Both the CPSC and HUD definitions of lead-containing paint are aimed at protecting the general population from exposure to lead in the residential setting. By contrast, the mission of the Occupational Safety and Health Administration (OSHA) with respect to lead-containing paint, is to protect workers during construction activities that may generate elevated airborne lead concentrations. OSHA states that construction work (including renovation, maintenance, and demolition) carried-out on structures coated with paint having lead concentrations lower than the HUD or CPSC criteria can still result in airborne lead concentrations in excess of regulatory limits. For this reason, OSHA has not defined lead-containing paint, but states that paint having any measurable level of lead may pose a substantial exposure hazard during construction work, depending upon the work performed.

Paint Sampling Methodologies

Direct measurements of lead in paint were made using a Radiation Monitoring Devices, Inc. (RMD) LPA-1 X-ray Fluorescence (XRF) Spectrum Analyzer (serial number 1020). The LPA-1 Lead Paint Analyzer non-destructively measures lead concentrations of painted surfaces, regardless of the number of layers present. These instruments were developed specifically for addressing lead-based paint issues in housing, and their use in identifying potential exposure hazards for renovation or construction work must be augmented by selective collection and analysis of physical paint chip samples.

The newer XRF instruments are capable of identifying lead in paint at concentrations of about 0.3 milligram per square centimeter (mg/cm^2) or greater. When lead concentrations are lower than this, the instruments are not capable of making accurate, reliable measurements, and the reported lead concentration may underestimate or overestimate the actual lead concentration in the paint. Therefore, any XRF readings of 0.4 mg/cm^2 or greater may be considered lead-containing from an OSHA perspective, and any readings of 0.3 mg/cm^2 or less should be confirmed by the collection and laboratory analysis of paint chip samples, or assumed to be positive for lead.

No chip samples was collected at this survey. Where paint chip samples are necessary, samples are collected according to the protocol specified in the HUD Guidelines. The samples are then submitted to a laboratory recognized under the EPA's National Lead Laboratory Accreditation Program (NLLAP) for analysis by flame atomic absorption spectrophotometry according to American Society of Testing and Materials (ASTM) method ASTM E 1645.

XRF Calibration Check

Before beginning the testing and after the testing was completed, the internal calibration of the LPA-1 was checked by taking three consecutive measurements on a National Institute for Standards and Technology (NIST) standard with a known concentration of lead. Three more readings were taken on a lead-free wood block. These calibration checks are reported within the XRF data tables found in Appendix A of this report and are maintained in a file at IHI to detect changes in instrument performance over time.

Lead Paint Inspection Data Tables

The XRF instrument generates a unique set of data tables for each inspection. The Sequential Report lists the measurements made throughout the property in sequential order, from the first measurement to the last. The Summary Report lists only the measurements that contain greater than or equal to 1.0 milligram of lead per square centimeter. The Detailed Report lists the measurements taken in each room. The data table is located in Appendix A to this report.

Results and Conclusion

The XRF instrument indicated that lead is present on some interior and exterior surfaces. These surfaces included the following:

A. Archives Building

Component	Substrate/Location	Color of Paint	Lead (mg/cm^2)
Interior			
Window sash	Metal Throughout building	Cream	3.6 - 4.4

C. State Capitol Building

Component	Substrate/Location	Color of Paint	Lead (mg/cm^2)
Interior			
Floor	Concrete Green lines on the east hallway, basement	Light Green	4.0
Pipe	Metal Pipe at the ceiling of the east hallway, basement	Purple	1.0
Wall	Ceramic tile Ladies room, basement	Tan	>9.9
Door	Metal Room 121, first floor Sergeant of Arms, third floor	Brown	1.0 - 8.5
Door, door casing	Metal Vault's door, room 121	Cream	1.0 - >9.9
Door, door jamb and casing	Metal Throughout Capitol	Varnish	1.0
Wall	Plaster Throughout Capitol	Cream	1.0 - >9.9
Stair railing cap and stringers	Metal Room 109 and Dome	Gray	2.0 - 5.3
Wall	Plaster Closet in men's restroom, second floor, Senate Chambers	Light Tan	3.5 - 3.8
Wall	Plaster Room 318, third floor	Beige	2.2
Ceiling	Plaster Senators' Gallery	Light Tan	2.3
Wall Trim	Plaster Senators' Gallery	Light Green	1.0
Wall Trim	Plaster House of Representatives and House Gallery	Gold	1.0 - 1.9
Baseboard	Wood Sergeant of Arms, third floor	Tan	1.6

C. Round House

Component	Substrate/Location	Color of Paint	Lead (mg/cm^2)
Interior			
Wall	Ceramic tile Dish washing area, serving area and the women's restroom	Dark Gray	>9.9

C. Stairwells of the State Office Building

Component	Substrate/Location	Color of Paint	Lead (mg/cm^2)
Interior			
Stair railing cap	Metal West, southwest and southeast stairs	Black	1.0 - 2.5

Because lead was detected in some of the building's painted surfaces, the OSHA Lead in Construction Standard (29 CFR 1926.62) will apply to any construction work (including renovation and demolition) that may disturb those surfaces. The standard requires, among other things, the following:

Initial training on the hazards of lead exposure, proper work practices, respiratory protection, and other topics;

- an initial exposure assessment, by air monitoring, to determine the lead exposures to all workers potentially exposed to airborne lead during manual demolition, sanding, cutting, or otherwise disturbing lead-painted materials;

- use of respirators and other protective clothing and equipment during the initial exposure assessment, until sample analysis indicates exposures below the Permissible Exposure Limit;

- hand washing facilities, designated clean change areas, and designated eating areas.

In addition to the above considerations, the presence of lead in demolition debris has the potential to impose limitations on where and how the debris may be disposed. The Resource Conservation and Recovery Act (RCRA), Subtitles C and D, require that the waste must be analyzed to determine the amount of leachable lead present. The type of test to be performed on the waste is the Toxicity Characteristic Leaching Procedure (TCLP) for lead, and the results of this test will determine whether the material must be handled and disposed of as hazardous waste. For structures containing large amounts of lead-containing paint, significant potential for failing the TCLP exists.

Introduction

During the period February 5 – 20, 2000 personnel from IHI Environmental collected water samples from the Capitol complex for analysis of lead and copper content. The purpose of the water sampling was to determine if the Capitol Complex water system is meeting the criteria for water systems as outlined in Section 1417 of the Safe Drinking Water Act.

The procedures prescribed in EPA's Lead in Drinking Water in Schools and Non-Residential Buildings dated April 1994 was followed for our initial sampling procedures, i.e., "morning, first-draw water" samples were collected after allowing outlets to sit unused for a period of at least 8-hours.

All water samples were collected in acid-treated Teflon bottles that were supplied by American West Analytical Laboratories in Salt Lake City, Utah. This same Laboratory performed all analysis of water samples. To ensure proper collection and handling of all water samples, EPA Manual entitled, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, was used for technical guidance.

Results of our test data are presented below:

Date	IHI sample #	Building	Location	Result-Copper mg/L	Result-Lead mg/L
February 5, 00	UTSA-W1	Archives	Kitchen	0.052	0.0050
February 5, 00	UTSA-W2	Archives	Kitchen/main	0.020	<0.0050
February 5, 00	UTSA-W3	Archives	1st floor drinking fountain	0.10	<0.0050
February 5, 00	UTSA-W4	Archives	Women's room 2nd floor	0.097	0.0090
February 6, 00	UTSC-W1	Capitol	Men's restroom basement	0.15	<0.0050
February 6, 00	UTSC-W2	Capitol	Drinking fountain basement	0.14	<0.0050
February 6, 00	UTSC-W3	Capitol	Basement B-49 storage area sink	0.27	0.010
February 6, 00	UTSC-W4	Capitol	1st floor drinking fountain adjacent to room 125	0.43	0.014
February 6, 00	UTSC-W5	Capitol	1st floor custodial sink	0.052	<0.0050
February 6, 00	UTSC-W6	Capitol	2nd floor Governor's kitchen sink	0.037	<0.0050

State of Utah – Capitol Complex 1
Lead and Copper water testing results

Date	IHI sample #	Building	Location	Result-Copper mg/L	Result-Lead mg/L
February 6, 00	UTSC-W7	Capitol	2nd floor men's room	0.039	<0.0050
February 6, 00	UTSC-W8	Capitol	3rd floor Supreme Court drinking fountain by room 350	0.15	0.0070
February 6, 00	UTSC-W9	Capitol	3rd floor kitchen sink adjacent to room 338	0.34	<0.0050
February 6, 00	UTSC-W10	Capitol	3rd floor NW quadrant House kitchen	0.057	0.014
February 6, 00	UTSC-W11	Capitol	4th floor House gallery kitchen	0.44	<0.0050
February 6, 00	UTSC-W12	Capitol	4th floor East quadrant kitchen	0.11	0.032*
February 6, 00	UTSC-W13	Capitol	4th floor water fountain SW quadrant	0.019	<0.0050
February 20, 00	SOB-W1	State Office Building	5th floor drinking fountain - central	0.22	<0.0050
February 20, 00	SOB-W2	State Office Building	4th floor drinking fountain - central	0.029	<0.0050
February 20, 00	SOB-W3	State Office Building	3rd floor drinking fountain - central	0.20	<0.0050
February 20, 00	SOB-W4	State Office Building	2nd floor drinking fountain - central	0.12	<0.0050
February 20, 00	SOB-W5	State Office Building	1st floor drinking fountain - central	0.10	<0.0050
February 20, 00	SOB-W6	State Office Building	Basement drinking fountain - central	0.12	<0.0050
February 20, 00	RH-W1	Round House	Kitchen sink	0.072	<0.0050
February 20, 00	BR-W1	Boiler Room	Drinking fountain	0.46	0.10*
February 20, 00	GH-W1	Green House	Drinking fountain	0.10	<0.0050

State of Utah – Capitol Complex 2
Lead and Copper water testing results

* Above the 0.02 mg/L EPA criteria

Discussion

The EPA has set forth Action Levels, which are part of the National Primary Drinking Water Regulations for water suppliers. The action level for lead is >0.015 mg/L in more than 10 percent of tap water samples. The Action Level for copper is >1.3 mg/L in 10 percent of tap water samples.

Sample Results for Copper:

The Capitol Complex buildings are within normal limits for copper in drinking water.

Discussion for Lead:

Under the National Primary Drinking Water Regulation for lead, the action level is established for water samples taken by public water suppliers in high-risk residences. It is important to note that the testing protocol used by public water suppliers is aimed at identifying system-wide rater than individual outlet problems. Because of this, the action level is lower for public water suppliers than the level that is recommended under this testing protocol for schools and non-residential buildings.

In addition to the above standard, the EPA has published guidance titled Lead in Drinking Water in Schools and Non-Residential Buildings, EPA 812-B-94-002, dated April 1994. This guidance is intended to be used for identification of sources of lead causing contamination problems, i.e., corrosion containing lead in the water lines, lead leeching fittings, taps, and mixing units.

It should be noted that the test procedure used was not to determine the lead content of water entering the facility, but rather a test of the contribution the individual drinking water outlets are making to the lead concentration in the facilities. Personnel from IHI selected water-sampling locations at random throughout the Capitol Complex, but in all cases chose either sinks or drinking water fountains as sample locations.

The initial sampling procedure outlined in EPA 812-B-94-002 includes allowing water to sit unused in the system for 8-hours or more, the longer the water in contact with plumbing containing lead, the greater the chances of it accumulating lead. The morning, first-draw samples will most likely reflect the "worst case" for any particular outlet. In this publication, EPA introduces the term "trigger" which means water sample results are higher than 0.020 mg/L.

Interpretation of Results:

There are two samples that are above and two samples that are near the EPA's "trigger" level for lead. Those exceeding the trigger level are in the Capitol and the other is in the boiler room. Those samples nearing the trigger level are both in the Capitol. See the attached table for exact sample locations.

Recommendations:

EPA recommends follow-up testing be conducted when initial test results reveal a lead concentration greater than 0.020 mg/l. We recommend following the guidance published by EPA under "follow-up" testing to conduct repeat testing as well as collecting samples from areas that were close to the trigger value.

The purpose of follow-up samples are to pinpoint where lead is getting into the drinking water so appropriate corrective measures can be taken. Additional samples from the interior plumbing are often necessary to further pinpoint the sources of lead contamination.

The sample protocol is similar to that of the initial sampling, i.e., water samples are collected before the water is used and after an appropriate "rest" period. The difference between initial and follow-up samples involves allowing the water to run for 30 seconds before collection. This sampling approach is designed to analyze the lead content in the water from the interior plumbing instead of the level of lead in the water itself as was measured on initial sampling.

In conjunction with follow-up testing in the Capitol, recommend the drinking water fountain in the boiler room be replaced, in the interim, recommend it's use be curtailed.

Universal Hazardous Waste Materials

State of Utah
Capitol Hill Complex
Salt Lake City, Utah

Executive Summary

The Archives Building, Boiler Plant, Capitol Building, Green House, and Round House, of the State of Utah Capitol Hill Complex, were visually inspected to identify building material or structure that contains hazardous material. Hazardous material includes asbestos-containing material, mercury thermostats, fluorescent light tubes, fluorescent light fixtures with ballasts containing polychlorinated biphenyl (PCB), refrigeration units containing chlorofluorocarbon (CFC), and drums or containers of hazardous or radioactive waste.

All material, fixtures, items, containers and waste listed in this section shall be disposed of at a facility approved to accept such waste for disposal and recycling. The asbestos-containing material is not included in this section.

Hazardous material requiring proper removal and disposal identified in the following buildings as follows:

A. Archives Building

Material	Location	Quantity
PCB ballast	At locations marked on the attached drawing	110 ballasts
Fluorescent light	Throughout building	220 tubes
Refrigerating unit (CFCs)	Lab 101 and kitchen	2 units

B. Boiler Plant

Material	Location	Quantity
PCB ballast	Boiler Plant, office, mechanic room	45 ballasts
Fluorescent light	Throughout building	132 tubes

C. State Capitol Building

PCB ballast	Basement: throughout; Second Floor: E. Quadrant, SW. section; Third Floor: E. Quadrant, Committee Offices; Fourth Floor: E. Quadrant, Legislative Auditor General's Offices Attic Space: throughout	783 ballasts
Fluorescent light	Same location as above	1,836 tubes
Refrigerating unit (CFCs)	Kitchens	4 units

C. Round House

Material	Location	Quantity
PCB ballast	Kitchen, storage rooms, offices, restrooms, and mechanical room	~58 ballasts
Fluorescent light	Throughout building	~232 tubes

The location for the light fixtures with PCB ballasts and the fluorescent light tubes for the Archives and Capitol Buildings is marked on the attached drawings.